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surface-rock of the country. On the summit of the mountain, which is about a mile in length, a brownish sandstone occurs, which may possibly be Jurassic or even cretaceous; but all the rocks are probably referable to the Jura-trias, with the exception of some dark igneous rocks which occur as dikes on the slopes of the mountain. Within about a thousand feet of the summit is a spring of good water, where there is a good camping-place. The slopes are timbered; scrubby firs and balsams occurring on the top, with scrub-oaks below, and tall pines still lower down. Among the latter are many beautiful parks. The plateau-level surrounding the mountain is well covered with fine tall grass, over which are scattered patches of piñon pines and small areas of bare red sandstone.

In the walls of a short cañon on the east side of the mountain, passed through by Mr. Wilson in his ascent, ruins of cliff or cave dwellings were seen in a cave or hollow in the rocks about five hundred feet above the bottom, and a hundred feet below the top.

Ascent of Mount Shasta.—Mr. Clarence King, in his 'Mountaineering in the Sierra Nevada,' says, "There is no reason why any one of sound wind and limbs should not, after a little mountaineering practice, be able to make the Shasta climb. There is nowhere the shadow of danger, and never a real piece of mountain climbing,—climbing, I mean, with hands and feet,—no scaling of walls, or labor involving other qualities than simple muscular endurance."

Mr. Gilbert Thompson, who, during the past summer and fall, spent about two months in topographic work on the slopes and summit of Mount Shasta, indorses this statement of Mr. King, and would add that there is no reason why a train of pack-mules may not be taken to the top of the peak. Mr. Thompson and one of his packers (Thomas Watson), on Sept. 10, 1883, tied their riding-mules to the iron signal-post which marks the extreme summit of the cone, and are the first who have ever taken riding-animals to the top of Mount Shasta. On Oct. 12, 1883, the pack-train was taken to an altitude of 13,000 feet, and would have been taken to the top had not the early snows prevented. Another season, however, Mr. Thompson expects to camp with his entire train upon the summit of Mount Shasta. From one of his camps, at an elevation of 7,400 feet, it required seven hours to go to the top with the riding-animals, while one member of the party, starting from the same camp on foot (taking, of course, a more direct route), reached the summit after a climb of six hours. It took two hours to get back to this camp, and three-quarters of an hour sufficed for the return to the camp which was located at the elevation of 13,000 feet. Mr. King and his party in September, 1870, made the ascent from the north-west. The first day they left their riding-animals at an elevation of about 10,000 feet, and climbed as far as the crater on the north-western spur, which point they reached about half-past one o'clock in the afternoon. They spent the night here, and on the following day, after a climb of four hours and a half, reached the summit. Mr. Thompson's ascent, mentioned above, was along a spur that ex-

tends toward the south-east. Up this spur he says there is a natural trail, only 500 or 600 feet of which will require any work to make it perfectly safe for mules or horses with packs. The route described by Mr. King, and the one *via* a south-western spur, are the routes usually followed by those who make the ascent from Strawberry valley, on the west side of the mountain. One member of Mr. Thompson's party climbed the mountain also from the east, which makes, altogether, four different routes by which it has been ascended. Mr. Thompson says there are two other possible ways by which the mountain can be climbed. These are on the north-east side. He reports, also, that there are seven glaciers located on the north and east slopes of Mount Shasta. Those on the north and north-east are connected at their heads. A north-west and south-east line would divide the glacier-bearing side of the mountain from the non-glacier-bearing half. However, some of the fields of snow and ice on the west side have considerable resemblance to glaciers, and may eventually be so determined.

Mr. Thompson suggests that Mount Shasta would be the best point in this part of the west for a permanent high meteorological station like those located on the summits of Mount Washington and Pike's Peak. Among the several reasons for this opinion, he mentions its accessibility, and the presence of hot-springs, which might be utilized in heating such a station, but more especially the fact that it is an isolated peak, rising high above the surrounding low country, and free, therefore, from the disturbing meteorological conditions induced by the presence of contiguous mountain ranges. Mount Shasta, Mr. Thompson says, does not belong to the Sierra Nevada nor to the Cascade Range, but stands alone.

During the season a line of levels was begun at Berryville, where connection was made with the railroad level, and carried some distance up the mountain. Next year this line will probably be carried to the summit of the peak.

NOTES AND NEWS.

THE Society of naturalists of the eastern United States, whose organization and aims were described in *Science* last spring, held a very successful and interesting meeting at Columbia college, New York, on Thursday and Friday of last week. The attendance was very large, and included many distinguished men. The membership has grown very rapidly, and now includes a large majority of the leading professional naturalists of the eastern states. The papers presented were of a high character, and many of them provoked a discussion such as is rarely heard in any scientific body; for seldom are so many men, devoted to one branch of pure science, gathered together. The communications, almost without exception, referred to problems of practical interest, and dealt especially with methods and the organization of scientific work, and also with methods of teaching.

Upon methods were read several papers, — Pro-

fessor James Hall, On a method of preparing rock-sections; Prof. B. G. Wilder, On the preservation of hollow organs, particularly the heart and brain; Prof. S. H. Gage, On the uses of peroxide of hydrogen in preparing skeletons; Dr. George Dimmock, On the uses of carminic acid in microscopical work; Mr. J. H. Emerton, On models of gigantic cephalopods; Dr. E. B. Wilson, On methods of section-cutting. Upon organization we may note Professor Wilder's paper, On the arrangement of a museum of vertebrates, and Professor Cope's, On academies of science in America, etc. Among the educational communications were those of Dr. Wadsworth, Upon methods of teaching in petrography and mineralogy, and Professor Bickmore's, Upon methods of teaching employed at the American museum, etc. The meeting surpassed in interest all expectations, and assures the future standing and prominence of the society, which, although so young, is yet through its membership so strong. The following officers were elected for the ensuing year: president, Professor Alpheus Hyatt; vice-presidents, Profs. H. N. Martin and A. S. Packard, jun.; secretary, Dr. Charles S. Minot; treasurer, Professor William B. Scott; members at large of the executive committee, Profs. H. C. Lewis and Lester F. Ward.

—The Swiss earthquake of 1881 had its centre of intensity in Berne and nearest vicinity, and is one of the best observed as to its extent and details. The geologic formation of the Swiss plateau, where the motions were most intensely felt, consists of a tertiary sandstone of unknown depth, called molasse, while the limestone rocks of the northern Alpine belt and of the Jura ridge were scarcely touched by it. Prof. Dr. A. Forster, the director of the telluric observatory at Berne, has collected a large amount of well-ascertained details on this earthquake, and published it in an interesting quarto memoir of twenty-nine pages, — 'Das erdbeben der schweizerischen hochebene vom 27 Januar 1881 (Berner beben),' Berne, *B. F. Haller*. The scientific results obtained by him may be summed up as follows: the principal shock occurred on Jan. 27, in the afternoon, at 2h. 19 m. 53 sec., and was preceded and followed by light oscillations of the soil. It took place at a coincidence of the perihelion with the perigee, the new moon being two days and a half later. There were no disturbances of terrestrial magnetism noticed for several days before and after; but a long period of frost had just given way to a sudden thaw, and the upper culmination of the moon had occurred five hours before. The whole area of seismic motion, with its longitudinal axis of two hundred and sixty kilometres, experienced the shock at one and the same astronomic time. There was no central shock, for the dislocation following the shock took place simultaneously upon the whole line. In the majority of places, villages, etc., it consisted of a brief, successory shaking, followed immediately by a few lateral and less energetic oscillations, all of them possessing a direction running approximately from east to west. The mean duration was but three to four seconds, the intensity varying from three to eight degrees of the Swiss-

Italian seismic scale. Noises usually connected with the heavier earthquakes were heard by most observers who happened to be outdoors: they preceded the shock or were synchronous with it, and none were heard after the shock. South of Martigny (Valais) and north of Mulhouse (Alsace) no disturbance was noticed; though numerous oscillations had occurred one and two weeks before, in southern Germany, Piedmont, and Lombardy. Compare A. Heim, on 'Swiss earthquakes in 1881,' published in the *Annuaire* of the telluric observatory of Berne (1881).

—Messrs. Cassino & Co. and Estes & Lauriat, of Boston, have issued a prospectus of the 'Standard natural history,' — a work in six volumes, imperial octavo, fully illustrated, and under the editorship of Dr. Elliott Coues and Mr. J. S. Kingsley. The staff of writers announced consists of forty-two names, including the larger part of our best-known authors, and all are men of repute. The first volume, on the lower vertebrates, will be by W. K. Brooks, S. F. Clarke, J. W. Fewkes, A. Hyatt, C. S. Minot, A. S. Packard, and others; the second, on the arthropods, by E. A. Birge, J. H. Comstock, A. J. Cook, J. H. Emerton, G. H. Horn, J. S. Kingsley, A. S. Packard, C. V. Riley, P. R. Uhler, etc.; the third, on the lower vertebrates, by E. D. Cope, T. Gill, S. Garman, D. S. Jordan, etc.; the fourth, on birds, by Dr. Elliott Coues alone; the fifth, on mammals, by E. D. Cope, E. Coues, T. Gill, S. Lockwood, G. Macloskie, R. R. Wright, and others; and the sixth, on the races of man, by C. C. Abbott, L. Carr, W. H. Dall, F. W. Putnam, and S. Salisbury. The work will be published in about sixty serial parts, of forty-eight pages each. The numbers already issued leave nothing to be desired in typography, good taste, and excellence in illustration; and we heartily wish so serious a venture every success.

—A new work on the "Theory of deflections and of latitudes and departures, with special applications to curvilinear surveys for alignments of railway-tracks" is in press by Van Nostrand. The author, Isaac W. Smith, is an engineer for some time connected with the construction bureau of the Northern Pacific railroad.

—'The legends of the Panjab,' in monthly numbers from August, 1883, by Capt. R. C. Temple, Bengal staff corps, records, in a form useful to investigators, the stories and legends preserved in the memories of the wandering bards of the Panjab. The legends are given in original in the Roman character, exactly as they were taken down from the lips of the narrators, with translations. The work is being published at the Education society's press, Bombay, and by Trübner & Co., Ludgate Hill, London.

—'The Nautical almanac and astronomical ephemeris for the meridian of the Royal observatory at Greenwich' for the year 1887, commonly known as the British nautical almanac, was published in London late in November. According to *Nature*, the sales of this publication for the last five years have exceeded 15,500 annually.